***भारतीय मानक***
***Indian Standard***

**IS 79 : 2021**

# पेंट्स के लिए स्टैंड अलसी के तेल की विशिष्टता

*( दूसरा पुनरीक्षण )*

# Specification for Linseed Stand Oil for Paints

*( Second Revision )*

ICS 87.060.30

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भारतीय मानक ब्यूरो
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**November 2021** **Price Group 5**

Raw Materials for Paints, Varnishes and Related Products Sectional Committee, CHD 21

## FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Raw materials for Paints, Varnishes and Related Products Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1950 and was based largely on the interim coordinated draft produced with the assistance of the representatives of manufacturers and various departments and authorities of the Government of India, by the Coordinating Subcommittee of the No. 5 Standing Committee on Specifications for Paints and Allied Stores of the General Headquarters (now Army Headquarters), India.

In first revision, substantial alignment with ISO 276 'Linseed stand oil' issued by the International Organization for Standardization (ISO), was achieved. It also incorporated the various types of the materials currently being produced and consumed in the country. Also, additional requirements for ash content, and for freedom from fish oil, linseed oil, blown oils and rosin was included. In place of four types in the original standard, revision prescribed eight types of the material and consequently the requirements for viscosity and acid value was also suitably modified. The requirement for saponification value was aligned with ISO 276. The test for viscosity was adopted from BS 188 'Determination of the viscosity of liquids in CGS units' issued by the British Standards Institution. The title of the standard was also suitably modified.

Raw material for paint products may contain lead and other heavy and toxic metals either because of use as catalyst or their compounds being essential adjunct of formulation in manufacturing of paints. Taking cognizance of the fact that lead and toxic heavy metal exposure of human being, particularly children in residential premises is injurious to health and having adverse impact on human health and safety, the Committee responsible for formulation of this standard has felt the need to introduce restriction of lead and toxic heavy metal restriction in all paint raw material product standards. Therefore, the second revision of this standard has been taken up with a view to incorporate the maximum permissible limit of lead and heavy metal restriction clause in this standard. Therefore, in this revision, lead restriction up to a maximum permissible limit of 90 ppm and toxic heavy metals restriction (cumulative other than lead) as 0.1 percent maximum has been prescribed to avoid hazardous impact of lead and heavy metal exposure and consequent adverse impact on environment and human health. Further, majority of consumers are not aware of the consequences of lead and other heavy metal toxicity and its long-term implications to human health. Therefore, in this revision, along with lead and heavy metal restriction, a suitable cautionary notice has been included in the marking clause.

Further, In this revision, the requirement for Iodine value has been added for which considerable assistant has been taken from ISO 150 "Raw refined and boiled linseed oil for paints and varnishes — Specification and method of test.

The Composition of the technical Committee responsible for the formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

# SPECIFICATION FOR LINSEED STAND OIL FOR PAINTS

*( Second Revision )*

## 1 SCOPE

This standard prescribes requirements and methods of sampling and test for linseed stand oil for paints.

## 2 REFERENCES

The Indian Standards given below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

| *IS No.* | *Title* |
|---|---|
| 74 : 1979 | Methods of sampling and test for drying oils for paints (*second revision*) |
| 323 : 2009 | Rectified spirit for industrial use — Specification (*second revision*) |
| 336 : 1973 | Specification for ether |
| 1070 : 1992 | Reagent grade water — Specification (*third revision*) |
| 1303 : 1983 | Glossary of terms relating. to paints (*second revision*) |
| 1745 : 2018 | Petroleum hydrocarbon solvents — Specification (*third revision*) |
| 101 (Part 8/Sec 5) : 1993 | Methods of Sampling and test for Paints, Varnishes, and related products: Part 8 Tests for pigments and other solids, Section 5 Lead restriction test |

## 3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 74 and IS l303 shall apply.

## 4 TYPES

There shall be eight types of the material as follows:

- a) Extra light,
- b) Light,
- c) Medium,
- d) Medium high,
- 5) High,
- 6) Extra high,
- 7) Heavy, and
- 8) Extra heavy.

## 5 REQUIREMENTS

### 5.1 Description

The material shall be polymerized linseed oil obtained only by heat treatment from linseed oil. It shall be free from sediment, insoluble matter and other oils.

### 5.2 Freedom from Fish and Linseed Oils

The material shall pass the test when tested as prescribed in Annex A.

### 5.3 Lead Restriction

The material shall be tested for restriction from lead in accordance with IS 101 (Part 8/Sec 5), or by Atomic Absorption Spectrometer (AAS) or by ICP. When thus tested the material shall not contain lead or compounds of lead or mixtures of both, calculated as metallic lead exceeding 90 ppm (*see* Note)

NOTE — When no lead is used during production (lead free).

### 5.4 Toxic Heavy Metal Restriction

Product shall not be manufactured using mercury and mercury compounds, cadmium, chromium VI, arsenic, antimony and their oxides. The material shall not contain more than 0.1 percent by weight in total of above toxic heavy metals in the form of natural impurities or impurities entailed by the production process which are contained in the raw material, when tested by the relevant Atomic Absorption Spectroscopic methods or by ICP method.

**5.4** The material shall also conform to the requirements given in Table 1.

**Table 1 Requirements for Linseed Stand Oil for Paints**

( *Clause* 5.3 )

| Sl No. | Characteristic | Requiremetn for | | | | | | | | Method of Test, Ref to Annex | Cl No. in IS 74 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Type 1 | Type 2 | Type 3 | Type 4 | Type 5 | Type 6 | Type 7 | Type 8 | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| i) | Odour | Similar to that of the approved sample | | | | | | | | – | 5 |
| ii) | Viscosity at 30 °C, stokes | 4-6 | 14-16 | 30-35 | 45-50 | 55-60 | 70-75 | 90-100 | 200-250 | B | – |
| iii) | Acid value, *Max* | 6 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | – | 9 |
| iv) | Saponification value | ← 186 to 200 → | | | | | | | | – | 10 |
| v) | Iodine Value, min | ← 175 → | | | | | | | | – | 11 |
| vi) | Unsaponifiable matter, percent by mass, *Max* | ← 2.0 → | | | | | | | | – | 12 |
| vii) | Ash, percent by mass, *Max* | ← 0.10 → | | | | | | | | – | 19 |
| viii) | Clarity and colour | ← As agreed to between the supplier and the purchaser → | | | | | | | | – | 3.5 & 5 |
| ix) | Liberman-storch-Morawski test for freedom from rosin(colophony) | ← Negative → | | | | | | | | – | 23 |
| x) | Test for presence of blown oil | ← Negative → | | | | | | | | C | – |

## 6 PACKING AND MARKING

### 6.1 Packing

The material shall be supplied packed in suitable containers as agreed to between the purchaser and the supplier.

### 6.2 Marking

The containers shall be marked with the following:

a) Name and type of the material;
b) Manufacturer's name or his recognized trade-mark, if any;
c) Mass of the material;
d) Lead content (maximum);
e) Toxic heavy metals content;
f) Batch number or lot number in code or otherwise;
g) Month and year of manufacture; and
h) Cautionary note as below:
    1) Keep out of reach of children, or
    2) This product may be harmful if swallowed or inhaled.

**6.2.1** The containers may also be marked with the ISI Certification Mark.

NOTE — The use or the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The 151 Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by IS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 7 SAMPLES

Representative samples of material shall be drawn as prescribed under **3** of IS 74.

## 8 TEST METHODS

**8.1** Tests shall be conducted as prescribed in IS 74 and Appendices A to C. References to relevant Appendices B and C and clauses of IS 74 are given in col 11 and 12 of Table 1 respectively, and to Annex A in **4.2**.

### 8.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall he employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

## 9 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to this standard if the test results of the composite sample satisfy the requirements prescribed under **4**.

# ANNEX A

( *Clause* 4.2 )

## TEST FOR FREEDOM FROM FISH AND LINSEED OILS

### A-1 GENERAL

**A-1.1 Outline of the Method**

The addition of bromine to unsaturated fatty acids of fish oil in a petroleum hydrocarbon solvent gives a precipitate. The formation of a precipitate of hexabromide when the oil is treated with bromine in chloroform and then with alcohol and ether indicates the presence of linseed oil.

### A-2 REAGENTS

**A-2.1 Petroleum Hydrocarbon Solvent —** 145/205 (low aromatic), conforming to IS : 1745.

**A-2.2 Bromine**

**A-2.3 Chloroform**

**A-2.4 Rectified Spirit** — Conforming to IS 323.

**A-2.5 Ether** — Conforming to solvent grade of IS 336.

### A-3 PROCEDURE

**A-3.1 Test for Freedom from Fish Oil**

Remove the moisture present, if any, by filtering through double layer filter paper. Dissolve 2 to 3 ml of the sample in 20 ml of the petroleum hydrocarbon solvent in a test tube. Mix well and keep in a freezer maintained at 10 ± 1°C for 5 min. Add bromine drop by drop from a burette avoiding vigorous action until a considerable excess is present as indicated by the presence of a strong red colour. Shake well and allow to stand in cold water at a temperature of 25 °C for 15 min. The material shall be taken to have passed this test if no cloudiness develops.

**A-3.1.1** If cloudiness or a precipitate appears due to bromination of the sample proceed as prescribed in **A-3.1.1.1** to **A-3.1.1.3.**

**A-3.1.1.1** Saponify 2 to 3 ml of the sample in a 100 m1 Erlenmeyer flask adding 3 ml of sodium hydroxide solution (50 percent) and 3 ml of ethanol. Place the mixture on a steam-bath and heat for about an hour under reflux. Remove the condenser and remove the ethanol avoiding evaporation to dryness. Add 40 ml hot water and boil for an hour to remove the traces of the ethanol. Pour the mixture into a 250 m1 separator)· funnel, washing the flask with 20 ml portions of boiling water. Acidify the mixture with 2 ml of 9 N sulphuric acid. Allow to settle until the fatty acids form a clear layer and the mixture is quite cold. Draw off the acid layer as completely as possible and wash the oil layer with 20 ml portions of saturated sodium chloride solution. Reject the washings. Add 20 ml of diethyl ether and dissolve the fatty acids by gently swirling the separatory funnel.

**A-3.1.1.2** Transfer the solution in a test tube and cool to 10 ± 1 °C for 5 min. Add bromine drop by drop from a burette avoiding vigorous action until a considerable excess is present as indicated by the presence of a strong red colour. Shake well and allow to stand in cold water at a temperature of 25 °C for 15 min. Centrifuge or filter and wash the precipitate with 5 ml portions of ethyl ether. Dry to remove the ether. Check the melting point of the precipitate.

**A-3.1.1.3** The material shall be taken to have passed this test if the precipitate melts completely at 180 to 183 °C, leaving no residue or blackening of the material.

**A-3.2** Test for freedom from linseed oil pipette 1 ml of sample in a dry test tube which may be fitted with a ground glass stopper. Add 5 ml of chloroform and about 1 ml of bromine dropwise till the mixture is deep red in colour. Cool the test tube in ice water-bath. Add about 1.5 ml of rectified spirit in drops with shaking until the precipitate which is formed just dissolves and then add 10 ml of ether. Mix and place the tube in the ice-bath for 30 min. Appearance of a precipitate or cloudiness indicates the presence of linseed oil.

**A-3.2.1** The requirement of this test shall be taken to have been satisfied if no precipitate or cloudiness appears.

# ANNEX B

[ *Table*1, *Item*(ii) ]

## DETERMINATION OF VISCOSITY

### B-1 APPARATUS

### B-1.1 Fall Tube and Thermostat Bath

**B-1.1.1** The fall tube (*see* Fig. 1), shall be supported vertically in a bath, which shall be constructed of clear glass or shall have clear glass windows of such length as to allow observation of all graduations on the fall tube. The bath shall be filled to at least 3 cm above the topmost graduation of the fall tube. The bath shall be provided with a cover, bored to carry the thermometer and a tube to hold the balls to be used for the test. It shall he provided with means for efficient stirring and for convenient location of the fall tubes in a vertical position to within 1°. The temperature of the bath shall be controlled by a thermostat so that the temperature variation in the bath is less than ±0.015 °C.

**B-1.1.2** Fall tubes shall be constructed of clear glass free, as far as possible, from visible defects and to the design and dimensions shown in Fig. 1. The nominal internal diameter shall be not less than 10 times the diameter of the ball; 25 mm and 40 mm are suitable.

Precision-bore tubing may be used.

**B-1.1.3** The fall tubes shall be of overall length 320±3 mm; the lower end shall be rounded and the open end cut square to the axis. The tubes shall be etched with fine marks at distances as given in Fig. 1, measured from a line 30 mm distant from the closed end. ‘These marks shall he carried right round the tube at right angles to the axis, and no interval shall be in error by more than 0.5 ram. The numbers shall be etched below the line in each case. To ensure axial delivery of the sphere, the fall tube shall be fitted either with a bored plug of inert non-absorbent material carrying a glass delivery tube or with a glass insert of the form shown in Fig. 1, adjusted so that the exit end of the tube will stand within 5 mm of the 220 mark on the fall tube. An internal diameter of 5 mm is suitable for use with a 1/8-in ball designation, and of 2.5 mm with a 1/16 in ball designation.

### B-1.2 Sphere

**B-1.2.1** *Selection of Sphere* — It is assumed that steel balls will be used, but the procedure specified will be suitable for spheres made of other materials if they are no less truly spherical and their diameters and densities can be measured with the required accuracy. Steel balls may be obtained guaranteed to be within ±0.000 1 in of the nominal diameter (for a 1/16 in bail this tolerance corresponds to an error of±0.3 percent in the viscosity). Steel balls shall be stored in liquid paraffin of IP quality or a similar preservative, to obviate rusting. Non-corroding steel balls are available.

The rate of fall of the sphere depends on its size and the viscosity of the liquid under test. Table 2 indicates the approximate relationship of these factors. The values given are uncorrected for the restriction on rate of fall due to the walls of the tube.

**Table 2 Relationship Between Rate of Fall and Viscosity**

| Designation of Steel Sphere | Viscosity of Liquid of Density 0.8 g/cm² | | | |
|---|---|---|---|---|
| | Rate of Fall 1.0 cm/s | Rate of Fall 0.3 cm/s | Rate of Fall 0.1 cm/s | Rate of Fall 0.03 cm/s |
| (1) | (2) | (3) | (4) | (5) |
| in | cS | cS | cS | cS |
| 1/16 | 1 120 | 3 740 | 11 200 | 37 400 |
| 3/32 | 2 520 | 8 400 | 25 200 | 84 000 |
| 1/8 | 4 490 | 15 000 | 44 900 | 150 000 |
| 5/32 | 7 010 | 23 400 | 70 100 | 234 000 |

NOTES

**1** A rate of fall greater than 1 cm/s should not be used.

**2** A ball/tube diameter ratio greater than 1 : 10 should not be used.

**3** When balls smaller than 1/16-in designation are selected their diameters shall be measured individually.

**B-1.2.2** *Determination of the Density of the Sphere* — This may be done by weighing a known number of balls after cleaning and drying. Makers of balls may be able to supply, from their own experience, information regarding the normal density and probable variation of their products.

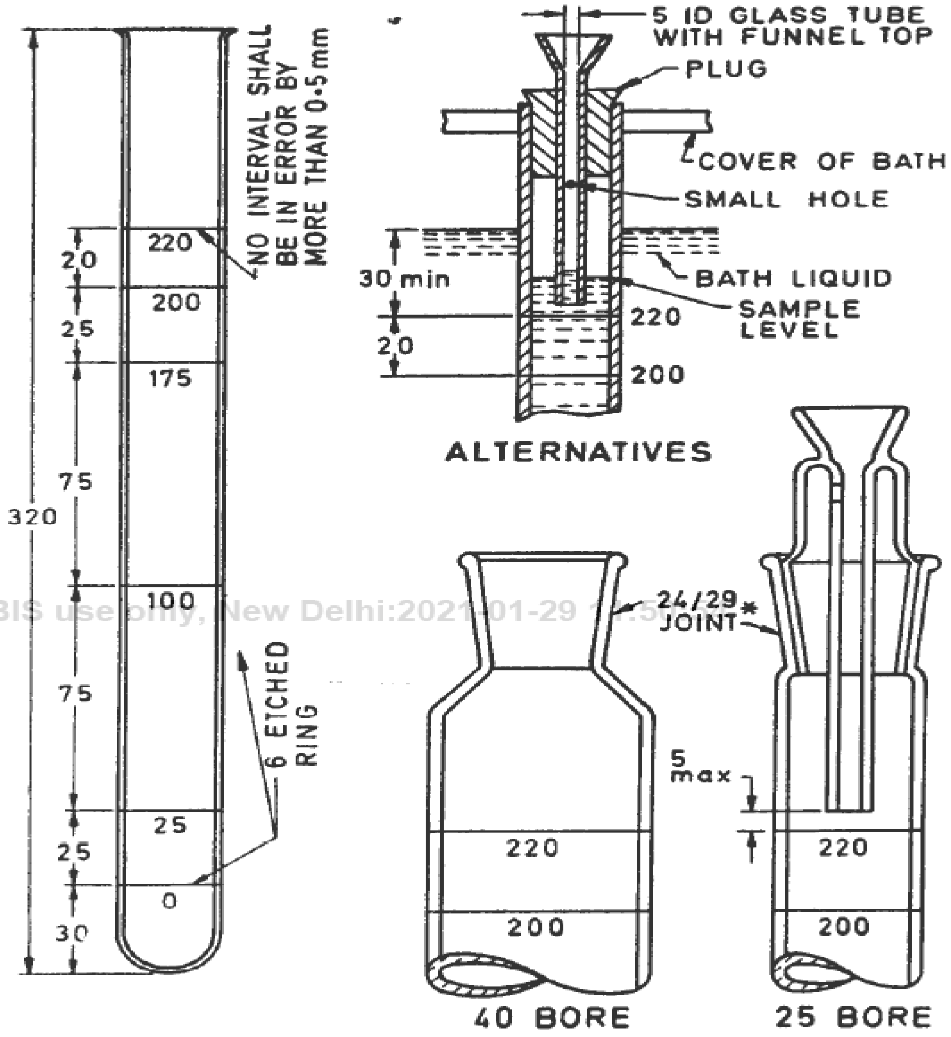
### B-2 PROCEDURE

### B-2.1 Preparation of Sample

Filter the sample through a sintered glass filter or through a 75 micron sieve. Determine the density of the sample, at the temperature of test, by means of a density bottle or pyknometer.

### B-2.2 Filling the Fall Tube

**B-2.2.1** Fill the tube to at least 3 mm above the topmost mark with the filtered sample which has been brought approximately to the temperature of observation. It is essential that the sample be free from air bubbles, and rare should be taken to avoid their formation. The tube shall be vertical.



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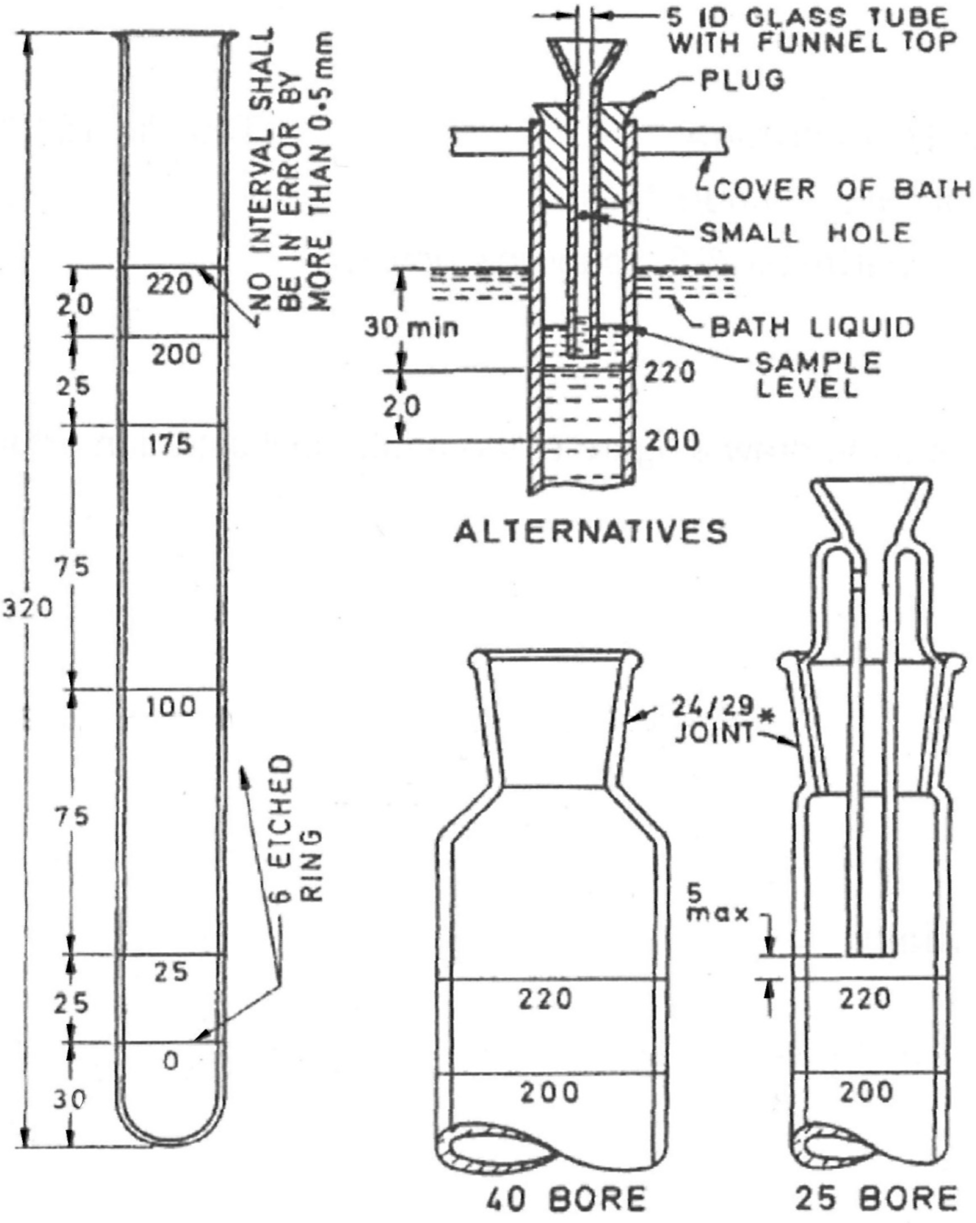

*See* IS 5165 Specification for interchangeable conical glass joints. All Dimensions in millimeters.

FIG. 1 FALLING SPHERE VISCOMETER

**Diagram of Fall Tube and of Ball Releasing Device with Alternatives**

**B-2.2.2** Leave the tube in the stirred bath for a sufficient time for air bubbles to clear and for temperature equilibrium to be attained. Usually a half to one hour is required when the filling temperature is near the test temperature. Longer times are necessary when the test and filling temperatures are markedly different.

**B-2.3 Determination of the Time of Fall**

**B-2.3.1** Clean the sphere to remove grease, and immerse it in the sample under *test,* which is at a temperature with 10.1 °C of the test temperature. Introduce it, without wiping, into the delivery tube by the aid of tweezers.

**B-2.3.2** By means of a reliable timing device, determine the time required for the sphere to fall through a suitable distance. The passage of the sphere may he observed by means of a telescope or other device for avoiding parallax error. The operation of the timing device is to coincide with the moments at which the lowest part of the sphere passes through the plane of the top of the tinting marks. Normally the sphere is timed from the 175-mm mark to the 25-mm mark, but the time from the 200 mm mark to the 0 mark may also be measured; if the fall is very slow, the definitive timing may be from the 175-mm mark to the 100-mm mark, using the time from the 200 mm mark to the 175-mm mark to provide a rough estimate of the rate. Obtain three readings agreeing within 0.5 percent.

NOTE — Apart from inaccuracies of the timing device, using spheres of different density or size, or inefficient control of the temperature, failure to obtain good repeatability of results may be due to:

a) inhomogeneity oldie liquid, caused, for example, by evaporation of the solvent from the surface, or partial gelation and separation of invisible clots, etc; and
b) non-Newtonian behaviour. If the latter cause is suspected it is advisable to check the values obtained by using ball, of different sizes and different portions of the tube.

## B-3 CALCULATIONS

**B-3.1** Calculate the kinematic viscosity V (centistokes) from one of the following equations:

$$V = Mg \frac{(\delta - \rho)}{0.03\, \pi\, v d \rho\, \delta} \times F \qquad ...(1)$$

$$V = \frac{d^2 g (\delta - \rho)}{0.18 v\, \rho} \times F \qquad ...(2)$$

where

$M$ = mass in g, of the sphere;
$d$ = diameter in cm, of the sphere;
$\delta$ = density of the sphere, in g/cm$^3$;
$\rho$ = density of the liquid in g/cm$^3$;
$v$ = velocity of fall, in cm/s; and
$g$ = local acceleration due to gravity in cm/s$^2$.

$F$ *is* known as the Faxen term and is a correction for the effect of wall of the fall tube on the motion of the sphere.

If $D$ *is* the diameter of the fall tube in cm, then the Faxen correction term is:

$$F = 1 - 2.104\, d/D + 2.09\, d^3/D^3 - 0.9\, d^5/D^5$$

For practical purposes, $F$ *is* only required to the third place of decimals and the expression may be reduced to:

$$F = 1.00 - 2.104\, d/D + 2.09\, d^3/D^3$$

Some values of $F$ are given in Table 3.

### Table 3 Faxen Corrections

( *Clause* B-3.1 )

| **Demonation of SPHERE, *d*** | **Faxen Correction, *F*** | |
|---|---|---|
| | Internal Diameter of Tube | |
| | *D* = 25 mm | *D* = 40 mm |
| (1) | (2) | (3) |
| 1/16 | 0-867 | 0.917 |
| 3/32 | 0.801 | 0.875 |
| 1/13 | 0.737 | 0.834 |
| 5/32 | 0674 | 0.793 |

**B-3.1.1** If a ball takes t seconds to fall 13 cm (that is, $v = 15/t$), in India (where $g = 979.1$ cm/s$^2$), then equations (1) and (2) above may he reduced to:

$$V = \frac{692.3Mt}{D} \times \left( \frac{1}{\rho} - \frac{1}{\delta} \right) \times F \qquad ...(3)$$

$$V = 362.6\, d^2 t \times \left( \frac{\delta}{\rho} - 1 \right) \times F \qquad ...(4)$$

IT the nominal diameters are assumed for the balls, the equations become:

$$V = K_m Mt \times \left( \frac{1}{\rho} - \frac{1}{\delta} \right) \times F \qquad ...(3a)$$

$$V = K_d t \times \left( \frac{\delta}{\rho} - 1 \right) \qquad ...(4a)$$

Some values in cgs units of $K_m$ and $K_d$, for a 150-mm fall and for various sphere designations, are given in Table 4.

### Table 4 Values of $K_m$ and $K_d$

( *Clause* B-3.1.1 )

| **DESIGNATION OF SPHERE** | **FOR 150 mm FALL IN t SECONDS** | | | |
|---|---|---|---|---|
| | *D* = 25 mm | | *D* = 40 mm | |
| | $K_m$ | $K_d$ | $K_m$ | $K_d$ |
| (1) | (2) | (3) | (4) | (5) |
| 1/16 | 3 791 | 7.94 | 4 009 | 8.40 |
| 3/32 | 2 335 | 16.51 | 2 550 | 18.03 |
| 1/8 | 1 611 | 27.00 | 1 823 | 30.55 |
| 5/32 | 1 179 | 38.58 | 1 387 | 45.39 |

# ANNEX C

[ *Table* 1, *Item* (ix) ]

## TEST FOR BLOWN OIL

### C-1 GENERAL

**C-1.1 Outline of the Method —** Sample is mixed with light petroleum hydrocarbon solvent and examined.

### C-2 APPARATUS

**C-2.1 Measuring Cylinder** — 50 ml capacity fitted with ground-glass joint.

### C-3 REAGENT

**C-3.1 Petroleum Hydrocarbon Solvent —** Boiling range 40 to 60 °C conforming to IS 1745.

### C-4 PROCEDURE

Take 10 ml of the sample of linseed stand oil in a 50 ml measuring cylinder and mix it thoroughly with 30 ml of light petroleum hydrocarbon solvent. Observe the clarity of the solution once in the beginning and once after three days storage at room temperature.

### C-5 REPORT

The sample shall be declared to have passed the test if the solution in initial observation is clear and it does not show any deposits after storage.

# ANNEX D

( *Foreword* )

## COMMITTEE COMPOSITION

Raw materials for Paints, Varnishes and Related Products Sectional Committee, CHD 21

,

| *Organization* | *Representative(s)* |
|---|---|
| In personal capacity (Retired from IIT Bombay) | Prof A. S. Khanna |
| Office of Micro, Small and Medium Enterprises, New Delhi | Shri Sunil Kumar Newar<br>Shri Santosh Kumar (*Alternate*) |
| Harcourt Butler Technical University, Kanpur | Dr P. K. Kamani<br>Dr Arun Maithani (*Alternate*) |
| ICT, Mumbai | Prof Sabnis<br>Prof Mahanwar (*Alternate*) |
| Indian Institute of Chem Technology, Hyderabad | Dr Ramanuj Narayen<br>Dr Pratyay Basak (*Alternate*) |
| Institute of Minerals and Materials Technology | Nomination Awaited |
| University Institute of Chemical Technogy, Jalgaon | Prof Ravindra Puri |
| Shriram Institute of Industrial Research | Shri A. K. Majumdar |
| Central Electro Chemical Research Institute, Karaikudi | C. Arunchandran<br>D. Sherwood (*Alternate*) |
| National Test House, Ghaziabad | Nomination Awaited |
| Naval Materials Research Laboratory | Nomination Awaited |
| Birla White | Dr R. K. Singh<br>Shri Om Prakash Gautam (*Alternate*) |
| Asian Paints Ltd, Mumbai | Mr Rajeev Kumar Goel<br>Dr Subrahmanya Shreepathi (*Alternate*) |
| Atul Limited | Dr Mahesh Soni<br>Dr Jayesh Joshi (*Alternate*) |
| Berger Paints India Limited, Kolkata | Shri T. K. Dhar<br>Shri Swagata Chakraborty (*Alternate*) |
| Clariant Chemicals (India) Ltd, New Delhi | Shri Nitin Vaidya<br>Shri Umesh Kapoor (*Alternate*) |
| Heubach India, Mumbai | Shri J. I. Sevak |
| Hindustan Zinc Limited, Delhi | Shrimati Payal Chauhan |
| Indian Chemical Council | Nomination Awaited |
| Indian lead zinc development association, New Delhi | Shri K. Sridhar |
| Indian Small Scale Paint Association | Shri Mukund Hulyalkar<br>Shri Mukesh Goyal (*Alternate*) |
| J J Chemicals | Nomination Awaited |
| Kansai Nerolac Paints Ltd, Mumbai | Shri Laxman Nikam<br>Shri Manoj Kumar Somani (*Alternate*) |
| Shalimar Paints Limited | Shri Gokul C. Sutradhar<br>Shri Chinmaya Nayak (*Alternate*) |

| *Organization* | *Representative(s)* |
|---|---|
| SSPC India Chapter | Dr Buddhadeb Duari (*Young professionals*)<br>Subhajit Bhattacharya (*Alternate* I)<br>Kaushik Duari (*Alternate* II) |
| 20 Microns Limited, Mumbai | Dr Anil Bansal |
| Rubamin Limited | Nomination Awaited |
| Vapi Oxide Colours Pvt, Ltd (VOXCO), Vapi | Shri Ishan Raveshia<br>Shrimati Minal Mayekar (*Alternate*) |
| Consumer Voice | Shri M. A. U. Khan<br>Shri B. K. Mukhopadhaya (*Alternate*) |
| BIS Director General | Ajay K. Lal Scientist 'E' and Head (CHD)<br>[ Representing Director General ( *Ex-officio* ) ] |

*Member Secretary*

Pushpendra Kumar
Scientist 'B' (CHD), BIS

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**Review of Indian Standards**

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of ‘BIS Catalogue’ and ‘Standards: Monthly Additions’.

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## Amendments Issued Since Publication

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